

NEW CENTRAL AMERICAN TAXA OF HELICONIA  
(HELICONIACEAE)

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MEMBERS OF THE primarily neotropical genus *Heliconia* L. (Heliconiaceae) are medium to large, sometimes treelike, herbaceous plants with colorful, often stout inflorescences. Although usually quite common in the neotropics, they are not often collected because of their large, fleshy stature. The recent taxonomic treatment of the heliconias of Costa Rica (Daniels & Stiles, 1979) emphasizes the need for critical field observations and photographs of live specimens *in situ*. Indispensable diagnostic characters, such as orientation of the inflorescence (erect vs. pendent), arrangement of the cincinnal bracts (spiral vs. distichous), color of various reproductive structures, and certain vegetative features, are in most cases absent from dried herbarium collections and are not recorded by the collector. R. R. Smith (1968) recognized 38 species in his unpublished revision of the heliconias of Middle America, which was based largely on herbarium material. Daniels and Stiles (1979) have listed at least that many species from only one of the countries covered in Smith's work. Even despite possible differences in species concepts and the fact that Costa Rica is floristically rich, the disparity between the two treatments in the number of described species of *Heliconia* is striking. As good field descriptions of living plants become available, additional new taxa of this genus will certainly be recognized.

The five new species and three new varieties of *Heliconia* treated here have been described from living collections in their natural habitats. Seven of the newly recognized taxa are from Panama, while the eighth, a variety previously recognized but not validly published, is found in Guatemala and El Salvador. These descriptions are part of a larger revision of the Central American species of *Heliconia* with pendent inflorescences (Kress, in prep.).

Descriptive terminology for the most part follows that of Daniels and Stiles (1979). Their "branch bracts" are referred to here as cincinnal bracts, and the basal width of these is measured from margin to margin near the rachis. Although other workers on Central American heliconias have made general reference to the single reduced staminode of the flowers, this floral part is used as a specific character in the following descriptions. The fruits have been described variously as berries, capsules, and "schizocarpic berries." An early study by Humphrey (1896) on seed development in the Zingiberales demonstrated that the mature fruit of *Heliconia* is a drupe with a stony endocarp enclosing the true seed. This interpretation is accepted here.

**Heliconia maculata** Kress, sp. nov.

FIGURE 1.

Planta herbacea 2–2.5 m. alta; caulis subviridi-griseus maculatus; inflorescentia pendens; pedunculus viridis et marroninus, glaber; rhachis rubra, glabra vel puberula; cincinnorum bracteae spirales, basi rubrae, ad apicem viridescentes, glabrae; perianthium basi luteum, apice viridulum, glabrum vel puberulum; ovarium album, pubescens; fructus lazulinus, glaber vel puberulus.

TYPE: Panama, Colón, along Río Guanche, 1 km. from the road to Portobelo, elev. ca. 8 m., 27 August 1980, *Kress & Knapp 80-1240* (DUKE, holotype; F, GH, K, MO, PMA, isotypes).

Herb with *Musa*-like habit, 2–2.5 meters tall. Leafy shoots congested in groups of 3 to 25; pseudostem pale greenish gray with distinctive dark brown spots throughout, glabrous, 1.2–1.7 meters tall, 2.2–2.5 cm. in diameter; leaves 6 per shoot, blades all tending to lie in single plane; petiole olive green, glabrous, 22–34 cm. long, 8–10 mm. in diameter; blade widest toward acute apex, base unequal and attenuate, extending along petiole, the upper surface green, glabrous, with midrib light green and glabrous, the lower surface gray-green, glabrous, with midrib yellow and glabrous to slightly scurfy, the longest blade 1.1–1.3 meters long, 24–26 cm. wide. Inflorescence pendent, to 51 cm. long (excluding peduncle); peduncle green and dark maroon, glabrous, 7–32 cm. long, 1 cm. in diameter; rachis flexuose, dull red, glabrous to slightly puberulous, 7–8 mm. in diameter at base; cincinnal bracts spirally arranged, 7 or 8 per inflorescence, oriented 90° to axis of inflorescence, the basal bract fertile or sterile, the middle bract with apex acuminate, margins straight becoming somewhat flared at base, inner surface pale orange and glabrous, outer surface red basally becoming green toward apex and glabrous, 14–17 cm. long, 4–4.5 cm. wide at base. Floral bracts translucent at anthesis, quickly decomposing, cream, glabrous to puberulous abaxially, glabrous adaxially, 4–5 cm. long, 1.1–1.4 cm. wide at base. Flowers 15 to 20 per cincinnus; pedicel pale yellow, pubescent to hirsute, 1–1.5 cm. long; perianth yellow basally becoming greenish toward apex, glabrous to slightly puberulous, 5 cm. long, 1 cm. wide at base, at anthesis curved 30–50°; free sepal lowermost, slightly reflexed, fused sepals with apices not reflexed; staminode white, apex apiculate, 7–10 mm. long, 3 mm. wide; stamens with anthers flared outside perianth apex; ovary white, pubescent, 4–5 mm. long, 6 mm. wide. Drupes blue, glabrous to puberulous, 8 mm. long, 9 mm. wide; stones 6 mm. long, 5 mm. wide.

SPECIMENS EXAMINED. **Panama.** COLÓN: Río Guanche, forest, elev. ca. 50 ft., *Maas et al. 1583* (F, MO); in forest 3–7 km. from bridge, elev. 300–700 ft., *Hammel et al. 4899* (MO).

PHENOLOGY. Flowering from late July through early October.

HABITAT AND DISTRIBUTION. This species occurs naturally at lower elevations along stream banks and in adjacent understory of primary forest. It will invade more open areas (often created by man), where it generally produces

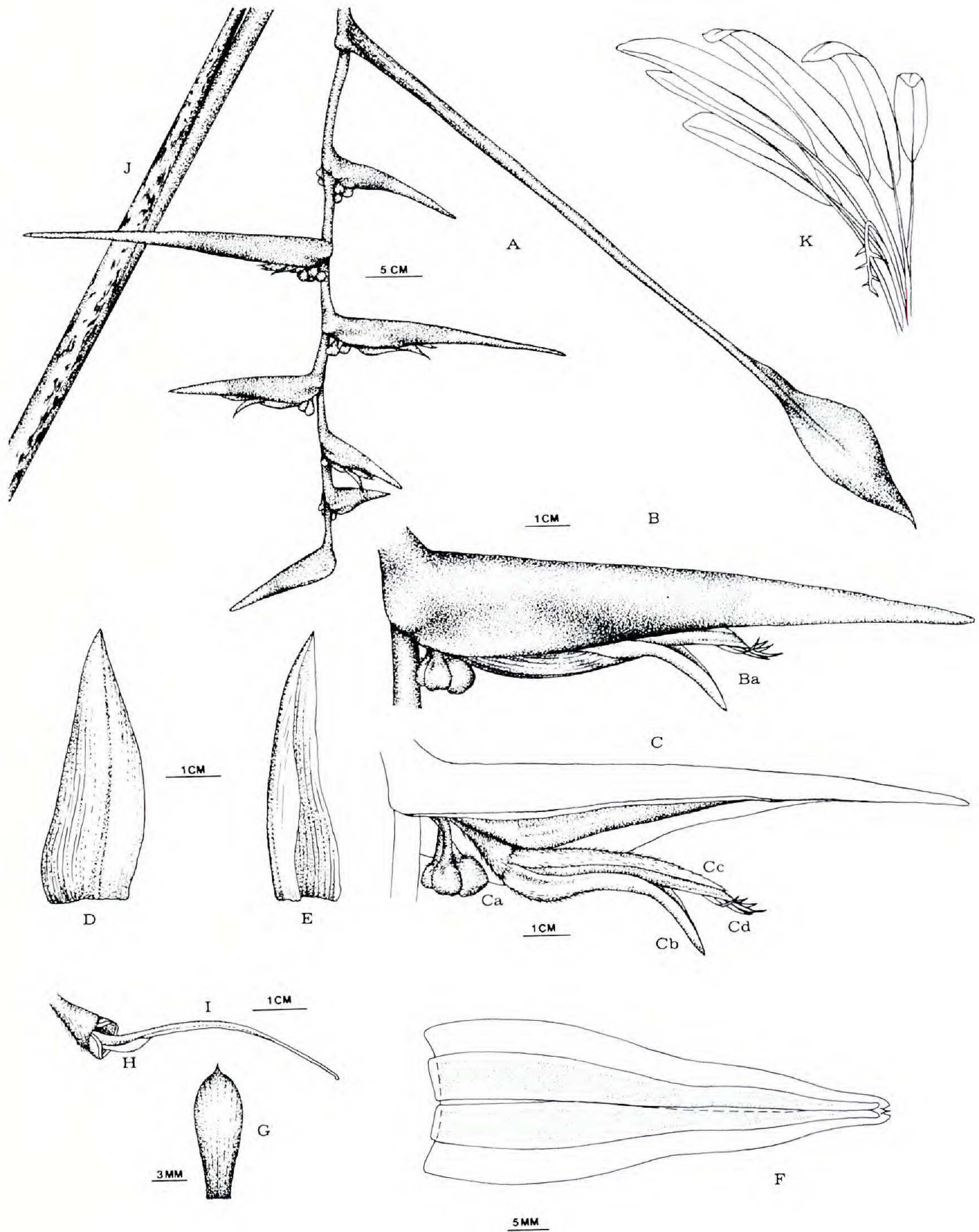


FIGURE 1. *Heliconia maculata*. A, inflorescence. B, C, cincinnal bracts: B, entire (Ba, flower protruding at anthesis); C, cut-away, floral bracts removed showing flower at anthesis (Ca, ovary; Cb, free sepal; Cc, fused sepals, not reflexed; Cd, anthers, exserted). D, E, floral bracts: D, abaxial view; E, lateral view. F, perianth, outer surface showing two sepals fused to partially spread-open corolla tube. G, H, staminodes: G, abaxial view; H, position relative to style, lateral view. I, style and stigma. J, pseudostem. K, vegetative habit.

more shoots per clump. So far *Heliconia maculata* has been collected only along Río Gaunche in Colón, Panama; it will probably also be found in other forested areas in the Atlantic coastal forests of Panama.

RELATIONSHIPS. Vegetative characters, including leaf blades that are oriented in a single plane and that are widest at the apex, and the distinctive pubescent ovaries, ally this species with *Heliconia colgantea* R. R. Smith ex Daniels & Stiles and *H. trichocarpa* Daniels & Stiles, of Costa Rica and Panama. However, it differs from these species in its spotted pseudostem (also present in *H. necrobracteata* Kress), red and green cincinnal bracts, and yellow and green perianth.

NAME. *Heliconia maculata* is named for the distinctive spotted pseudostem, which allows the plant to be identified even if it is not in flower.

***Heliconia magnifica* Kress, sp. nov.**

FIGURE 2.

Planta herbacea 4–6 m. alta; inflorescentia pendens; pedunculus et rhachis atrovinosa, pubescentia lanata aurea praedita; cincinnorum bracteae spirales, rubrae, pubescentes vel velutinae; perianthium basi album, apice lutescens pubescentia aurea praedita; ovarium album, glabrum.

TYPE: Panama, Panamá, Cerro Campana, beyond the Su Lin Motel, elev. 1000 meters, 15 August 1977, *Kress, Clarkson, & McDade 77-850* (DUKE, holotype; K, MO, isotypes).

Herb with *Musa*-like habit, 4–6 meters tall. Leafy shoots in groups of 1 to 5; pseudostem rusty brown, scurfy, 1.1–2.3 meters tall, 3–7 cm. in diameter; leaves 3 or 4 per shoot; longest petiole light green and maroon, glabrous, 1.1–1.8 meters long, 1–1.9 cm. in diameter; blade splitting into narrow lateral segments with age, base unequal and truncate to cordate, apex acute, the upper surface dark green, glabrous, with midrib yellow-green and glabrous, the lower surface green with maroon margins, glabrous, with midrib yellow-green and glabrous, the longest blade 1.1–1.9 meters long, 36–55 cm. wide. Inflorescence pendent, to 94 cm. long (excluding peduncle); peduncle dark red to burgundy, woolly with golden hairs, 30–50 cm. long, 1–1.7 cm. in diameter; rachis flexuose, red to burgundy, woolly, 1–1.6 cm. in diameter near basal bract; cincinnal bracts spirally arranged, up to 35 per inflorescence, oriented 30–50° to axis of inflorescence, the basal bract usually fertile, the middle bract with apex acuminate, margins straight becoming involute at base, inner surface white to red and pubescent to velutinous, outer surface red to burgundy and velutinous to villous with golden hairs, 8–10 cm. long, 7.5–9.5 cm. wide at base. Floral bracts opaque, persistent, pink, glabrous to velutinous abaxially, glabrous adaxially, 3.5–5 cm. long, 1–1.5 cm. wide at base. Flowers 10 to 15 per cincinnus; pedicel white becoming pink near ovary, glabrous, 1–1.3 cm. long; perianth white basally becoming yellow toward apex, glabrous basally becoming tomentose with golden hairs toward apex, 5.5–6 cm. long, 1–1.2 cm. wide at base, at anthesis curved 80–90°; free sepal lowermost, reflexed, fused sepals with apices slightly

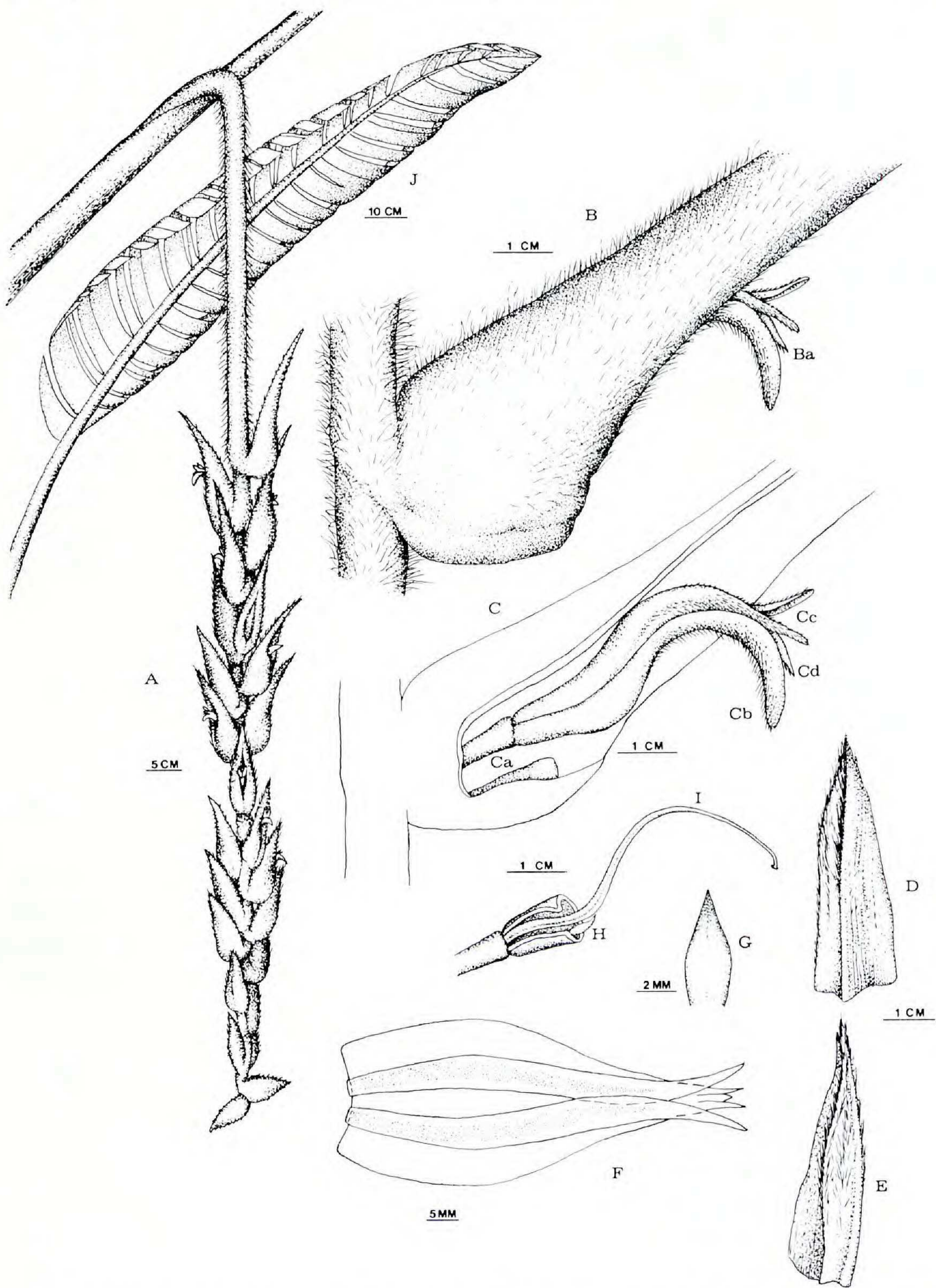


FIGURE 2. *Heliconia magnifica*. A, inflorescence. B, C, cincinnal bracts: B, entire (Ba, flower protruding at anthesis); C, cut-away, floral bracts removed showing flower at anthesis (Ca, ovary; Cb, free sepal; Cc, fused sepals, partially reflexed; Cd, anthers, included in apex of corolla tube). D, E, floral bracts: D, abaxial view; E, lateral view. F, perianth, outer surface showing two sepals fused to partially spread-open corolla tube. G, H, staminodes: G, abaxial view; H, position relative to style, lateral view. I, style and stigma. J, mature leaf, blade split into lateral segments.

reflexed; staminode white becoming yellow at acuminate apex, 5–6 mm. long, 2–3 mm. wide; stamens with anthers connivent inside apex of corolla tube; ovary white, glabrous, 1–1.1 cm. long, 5–6 mm. wide. Drupe deep blue, glabrous, 1.2–1.3 cm. long, 8–10 mm. wide; stones 9 mm. long, 6 mm. wide.

**SPECIMENS EXAMINED.** **Panama.** PANAMÁ. Cerro Campana: elev. 600 m., *Antonio 1250* (MO), *Antonio 1725* (MO); elev. 850 m., *Busey 847* (MO), *Liesner 627* (F, MO, NY); elev. 2600–2800 ft., *Lewis et al. 1903* (MO); elev. 800–1000 m., *Gentry 4955* (F, MO, SCZ); elev. 1000 m., *Allen 2425* (MO); near summit, elev. 1000 m., *Kress & Cooper-Smith 76-648* (DUKE); elev. 2700–3200 ft., *Hammel 3783* (MO); elev. 3300 ft., *Kress 80-1246* (DUKE); 3/4 of way to summit from Pan American Hwy., *Dwyer et al. 4850* (MO); cloud forest, *Luteyn & Kennedy 1814* (DUKE); without further location, *C. E. Smith & H. M. Smith 3399* (US).

**PHENOLOGY.** Flowering mainly from March to September, but mature inflorescences can be found throughout the year.

**HABITAT AND DISTRIBUTION.** This species is found at middle elevations (above 600 m.) in the understory of cloud forest; it is endemic to Cerro Campana in Panama.

**RELATIONSHIPS.** *Heliconia magnifica* is closely related to species of the pogonantha group with large pendent inflorescences, including *H. vellerigera* Poeppig, *H. ramonensis* Daniels & Stiles, and *H. xanthovillosa* Kress, all found in Central America. It is distinguished from these species by the dark red to burgundy color of the inflorescence and by the golden, woolly pubescence covering the peduncle, rachis, and cincinnal bracts.

**NAME.** The epithet “magnifica” has been used for this taxon for over 25 years (first by C. V. Morton, then by I. Lane,<sup>1</sup> and finally by R. R. Smith) but has never been validly published. Since investigators have continued to recognize the species under that name, it is used here as an adequate descriptive epithet for this “magnificent” *Heliconia*.

***Heliconia necrobracteata* Kress, sp. nov.**

FIGURE 3.

Planta herbacea 4–4.5 m. alta; caulis viridi-griseus maculatus; inflorescentia pendens, rubra; cincinnorum bracteae spirales, post anthesin celeriter marcescentes; perianthium luteum; ovarium luteum, glabrum; fructus lazulinus.

**TYPE:** Panama, Coclé, 6 miles beyond El Valle de Antón behind Cerro Gaital, elev. 900 meters, 12 August 1977, *Kress, Clarkson, & McDade 77-842* (DUKE, holotype; K, MO, isotypes).

Herb with *Musa*-like habit, 4–4.5 meters tall. Leafy shoots in groups of 3 to 12; pseudostem dull grayish green with brown spots, glabrous, 1–2 meters tall, 4–6.5 cm. in diameter; leaves 3 to 5 per shoot; longest petiole olive

<sup>1</sup>References throughout this paper to I. Lane refer to annotations made by Lane on herbarium specimens.

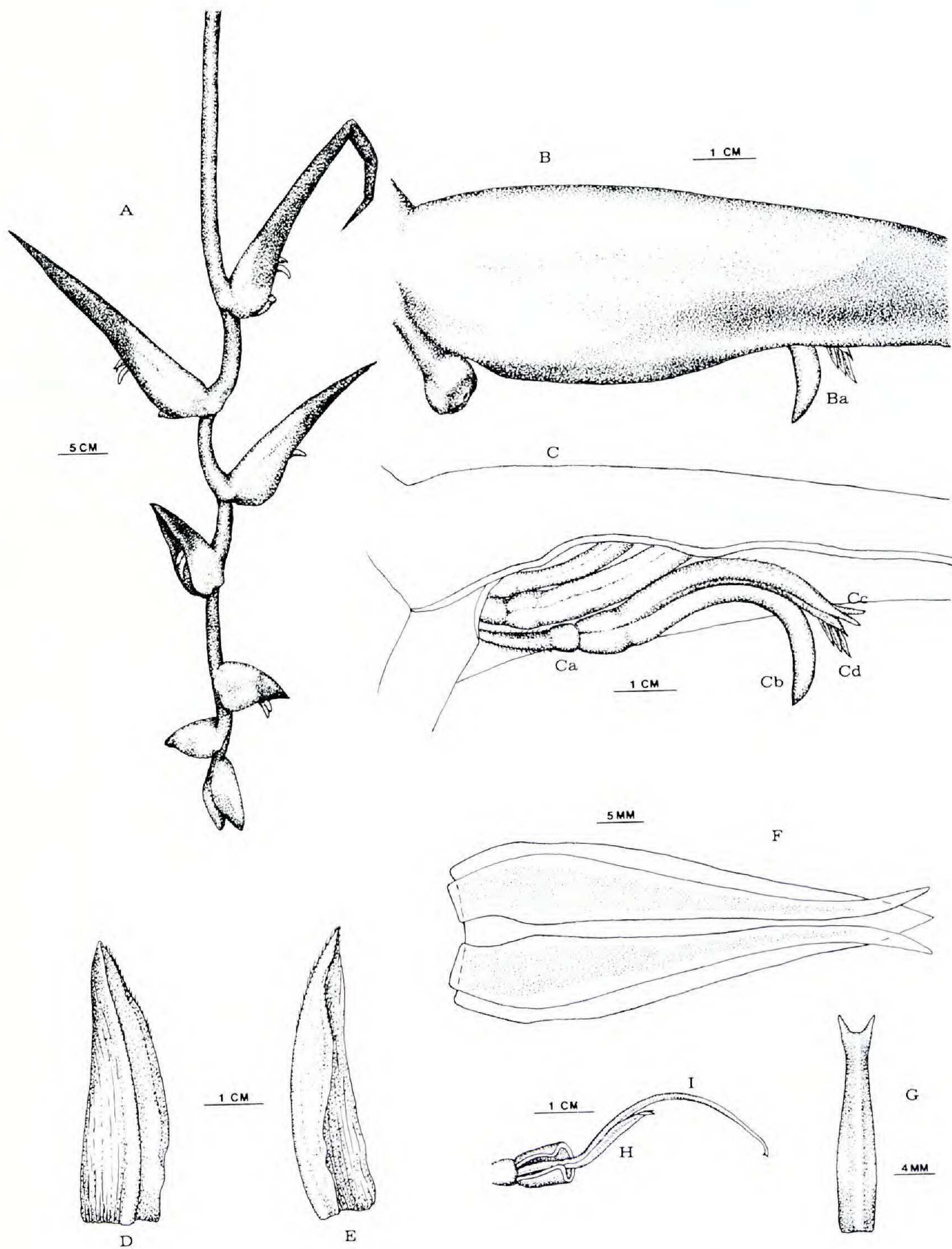


FIGURE 3. *Heliconia necrobracteata*. A, inflorescence. B, C, cincinnal bracts: B, entire (Ba, flower protruding at anthesis); C, cut-away, floral bracts removed showing flower at anthesis (Ca, ovary; Cb, free sepal; Cc, fused sepals, slightly reflexed; Cd, anthers, partially exserted). D, E, floral bracts: D, abaxial view; E, lateral view. F, perianth, outer surface showing two sepals fused to partially spread-open corolla tube. G, H, staminodes: G, abaxial view; H, position relative to style, lateral view. I, style and stigma.

green, glabrous, 65–100 cm. long, 1.5–2 cm. in diameter; blade widest toward acute to obtuse apex, with base unequal and attenuate along petiole, the upper surface dark green, glabrous, with midrib light green and glabrous, the lower surface gray-green, glabrous, with midrib yellow-green and glabrous, the longest blade 1.9–2.4 meters long, 25–35 cm. wide. Inflorescence pendent, 40–55 cm. long (excluding peduncle); peduncle red, glabrous to puberulous, 25–35 cm. long, 1.3–1.8 cm. in diameter; rachis flexuose, dark red, puberulous, 1–1.4 cm. in diameter at base; cincinnal bracts spirally arranged, 10 to 22 per inflorescence, oriented 40–45° to axis of inflorescence, becoming more reflexed with age, the basal bract usually fertile, the middle bract with apex acuminate, margins straight, inner surface yellow (sometimes with red margins) and glabrous, outer surface red and glabrous to puberulous, 12–17 cm. long, 7–8 cm. wide at base, all becoming necrotic soon after anthesis, deteriorating distally first and basipetally with age. Floral bracts ± translucent at anthesis, quickly decomposing, white, puberulous to velutinous along margins abaxially, glabrous adaxially, 3.5–4.5 cm. long, 1.5–2 cm. wide at base. Flowers 8 to 13 per cincinnus; pedicel pale yellow, tomentose, 1.4–2.2 cm. long; perianth yellow to deep yellow, glabrous, puberulous along margins, 4.5–5 cm. long, 6–9 mm. wide at base, at anthesis curved 50–80°; free sepal lowermost, reflexed, fused sepals with apices slightly reflexed; staminode white, apex dentate, 1.5–2 cm. long, 4–5 mm. wide; stamens with anthers connivent partially inside apex of corolla tube; ovary pale yellow, glabrous, 5–6 mm. long, 6–7 mm. wide. Drupes blue, glabrous.

**SPECIMENS EXAMINED.** **Panama.** COCLÉ: base of three peaks beyond El Valle de Antón, elev. 800 m., *Kress & Cooper-Smith 76-652* (DUKE); El Valle de Antón, behind Cerro Gaital, elev. 2200 ft., *Kress et al. 80-1158* (DUKE); mountains above El Valle, in forest on Sr. Furlon's finca, *Stimson 5037* (SCZ), *Stimson 5038* (SCZ).

**PHENOLOGY.** Flowering early in the rainy season (April) and probably continuing through late August.

**HABITAT AND DISTRIBUTION.** This species is found on steep, forested slopes at elevations of 650–1000 meters in the region of El Valle de Antón in Panama. As more collections are made in the provinces of Coclé and Veraguas, especially on the Atlantic slopes, it is expected that the known distribution will be extended.

**RELATIONSHIPS.** *Heliconia necrobracteata*, together with *H. trichocarpa* Daniels & Stiles, *H. colgantea* R. R. Smith ex Daniels & Stiles, and *H. maculata* Kress, is included in one of the several groups of species with small pendent inflorescences. It is distinguished by its necrotic cincinnal bracts, its glabrous ovaries, and its generally stouter vegetative shoots and inflorescences.

**NAME.** This species is named for its distinctive red cincinnal bracts that decompose and turn black beginning distally and progressing basipetally even while flowers are still being produced.



***Heliconia sessilis*** Kress, sp. nov.

FIGURE 4.

Planta herbacea 6–7 m. alta; inflorescentia nutans vel pendens, sessilis, rubra; pedunculus occultus; rhachis rubra vel lutea, puberula; cincinnorum bracteae spirales, rubrae, glabrae; perianthium luteum, glabrum; ovarium album, glabrum.

TYPE: Panama, Colón, along the road between Gatun Lock and Fort Sherman, elev. ca. 3 meters, 28 August 1980, *Kress 80-1241* (DUKE, holotype; F, GH, K, MO, PMA, isotypes).

Herb with *Musa*-like habit, 6 to 7 meters tall. Leafy shoots in groups of 10 to 20; pseudostem green to brown, glabrous, 2.5 meters tall, 8–9 cm. in diameter; leaves 4 or 5 per shoot; petiole olive green, glabrous, 1.4–1.8 meters long, 2 cm. in diameter; blade with base unequal and attenuate to obtuse, apex acute, the upper surface green, glabrous, with midrib olive green and glabrous, the lower surface dull green, glaucous, with midrib yellow-green with central maroon stripe and slightly glaucous, the longest blade 2 meters long, 40–60 cm. wide. Inflorescence nodding to pendent, to 90 cm. long; peduncle obscure, red, puberulous, 2 cm. in diameter; rachis flexuose, red at base of inflorescence becoming yellow toward distal bracts, puberulous, 1.8–1.9 cm. in diameter at base; cincinnal bracts spirally arranged, 23 to 30 per inflorescence, oriented 90° to axis of inflorescence, the basal bract usually sterile, the middle bract with apex acute, margins straight becoming involute near rachis, inner surface white to pink and glabrous to puberulous, outer surface red and glabrous, 8–9 cm. long, 9 cm. wide at base. Floral bracts opaque, persistent, pale yellow becoming pink along margins, puberulous abaxially, glabrous adaxially, 3.5–4 cm. long, 1.8–2.1 cm. wide at base. Flowers 15 to 20 per cincinnus; pedicel white becoming reddish near ovary, glabrous, 6–10 mm. long; perianth distally deep yellow becoming paler at base, glabrous except for puberulous sepal margins, 4.8–5.1 cm. long, 1.1–1.2 cm. wide at base, at anthesis curved 30–40°; free sepal lowermost, reflexed, fused sepals with apices reflexed; staminode white to pale yellow, apex cuspidate, 6–7 mm. long, 3 mm. wide; stamens with anthers connivent inside apex of corolla tube; ovary white becoming pale lavender around apex, glabrous, 1–1.2 cm. long, 6–7 mm. wide. No mature fruits seen.

SPECIMENS EXAMINED. **Panama.** CANAL ZONE: vic. of Fort Sherman, W. of Colón, near sea level, *Kress & Clarkson 77-871* (DUKE); Barro Colorado Is., laboratory clearing, *Croat 12422* (MO, NY, SCZ).

PHENOLOGY. Flowering during the wettest part of the rainy season in Panama, from late August probably to December.

HABITAT AND DISTRIBUTION. This species is found in flooded secondary growth in the Atlantic coastal lowlands of Panama. Only a very localized population has been found west of Colón, but this species may be scattered farther east in Panama and even into South America.

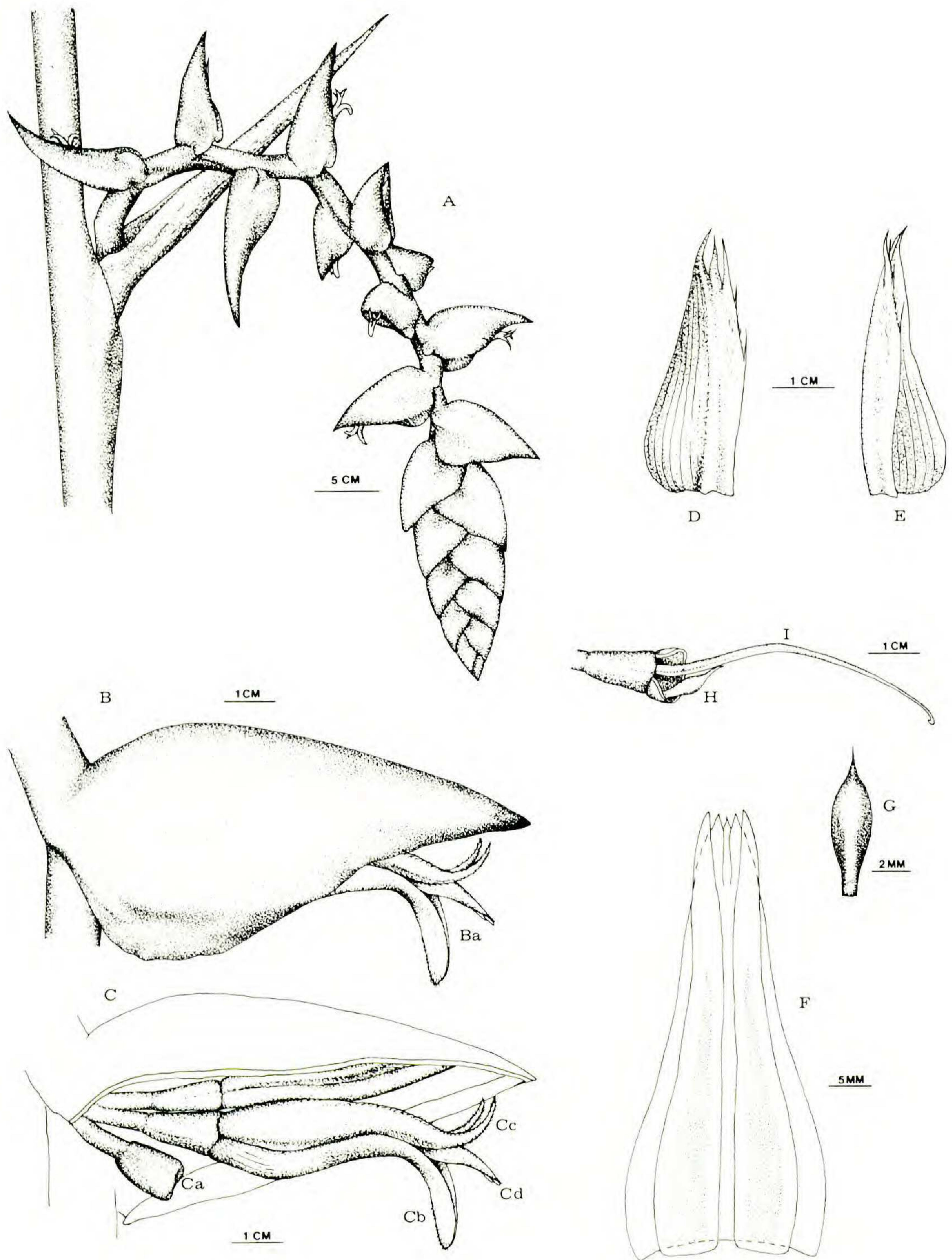


FIGURE 4. *Heliconia sessilis*. A, inflorescence. B, C, cincinnal bracts: B, entire (Ba, flower protruding at anthesis); C, cut-away, floral bracts removed showing flower at anthesis (Ca, ovary; Cb, free sepal; Cc, fused sepals, reflexed; Cd, anthers, included in apex of corolla tube). D, E, floral bracts: D, abaxial view; E, lateral view. F, perianth, outer surface showing two sepals fused to partially spread-open corolla tube. G, H, staminodes: G, abaxial view; H, position relative to style, lateral view. I, style and stigma.

RELATIONSHIPS. *Heliconia sessilis* fits into the group with large shoots and pendent inflorescences, including *H. pogonantha* Cufod. and *H. longa* (Griggs) Winkler, but probably has its closest relatives in South America. It is characterized by its sessile inflorescence, by its only slightly curved (30–40°) perianth, and by its occurrence in semi-aquatic habitats.

NAME. This species is named for the distinctive sessile nature (reduced peduncle length) of the inflorescence, which causes the basal cincinnal bracts to open upward and the more distal bracts to open downward.

***Heliconia xanthovillosa* Kress, sp. nov.**

FIGURE 5.

Planta herbacea 3.5–4.5 m. alta; inflorescentia pendens, lutea vel viridi-lutea, pubescentia lanata flava praedita; cincinnorum bracteae distichae; perianthium basi album, apice lutescens pubescentia lutea praedita; ovarium album, glabrum; fructus caeruleus, glabrus.

TYPE: Panama, Panamá, El Llano–Carti Road, 12 km. from intersection with Pan American Hwy., elev. 500 meters, 27 August 1980, *Kress & Knapp 80-1233* (DUKE, holotype; F, GH, K, MO, PMA, isotypes).

Herb with *Musa*-like habit, 3.5–4.5 meters tall. Leafy shoots in groups of 2 to 11; pseudostem brown, scurfy to hirsute, 1.6–1.9 meters tall, 6–6.5 cm. in diameter; leaves 4 per shoot; petiole dull green, glabrous, 1.1–1.2 meters long, 1.9–2 cm. in diameter; blade with base unequal and obtuse to truncate, apex acute, the upper surface green to dark green, glabrous, with midrib light green and glabrous, the lower surface green, glabrous, with midrib yellow-green and glabrous, the longest blade 1.9–2.3 meters long, 49–52 cm. wide. Inflorescence pendent, to 86 cm. long (excluding peduncle); peduncle bright yellow-green, woolly with yellow hairs, 26–68 cm. long, 1.5–2.2 cm. in diameter; rachis flexuose, bright yellow, woolly, 1.5–1.9 cm. in diameter at base; cincinnal bracts distichous, up to 35 per inflorescence, oriented 35–45° to axis of inflorescence, the basal bract sterile or fertile, the middle bract with apex acuminate to acute, margins straight, inner surface pale yellow-green and pubescent, outer surface bright yellow to green-yellow and woolly with yellow hairs, 8–10 cm. long, 7–8 cm. wide at base. Floral bracts opaque, persistent through fruiting, pale yellow, pubescent abaxially, glabrous adaxially, 3.7–4.8 cm. long, 1.6–1.7 cm. wide at base. Flowers 12 to 20 per cincinnus; pedicel white, glabrous, 1 cm. long; perianth white basally becoming yellow distally, glabrous basally becoming pubescent with bright yellow hairs distally, 5.1–5.5 cm. long, 9–11 mm. wide at base, at anthesis curved 85–90°; free sepal lowermost, reflexed, fused sepals with apices slightly reflexed; staminode white, apex acuminate, 5 mm. long, 3 mm. wide; stamens with anthers connivent inside apex of corolla tube; ovary white, glabrous, 7–8 mm. long, 5–6 mm. wide. Drupes blue, glabrous, 1.1–1.2 cm. long, 8 mm. wide; stones 8–9 mm. long, 5–6 mm. wide.

SPECIMENS EXAMINED. **Panama.** PANAMÁ. El Llano–Carti Rd.: 8 mi. from Pan American Hwy., elev. 1200 ft., *Antonio 1699* (MO), elev. 300–500 m., *Folsom*

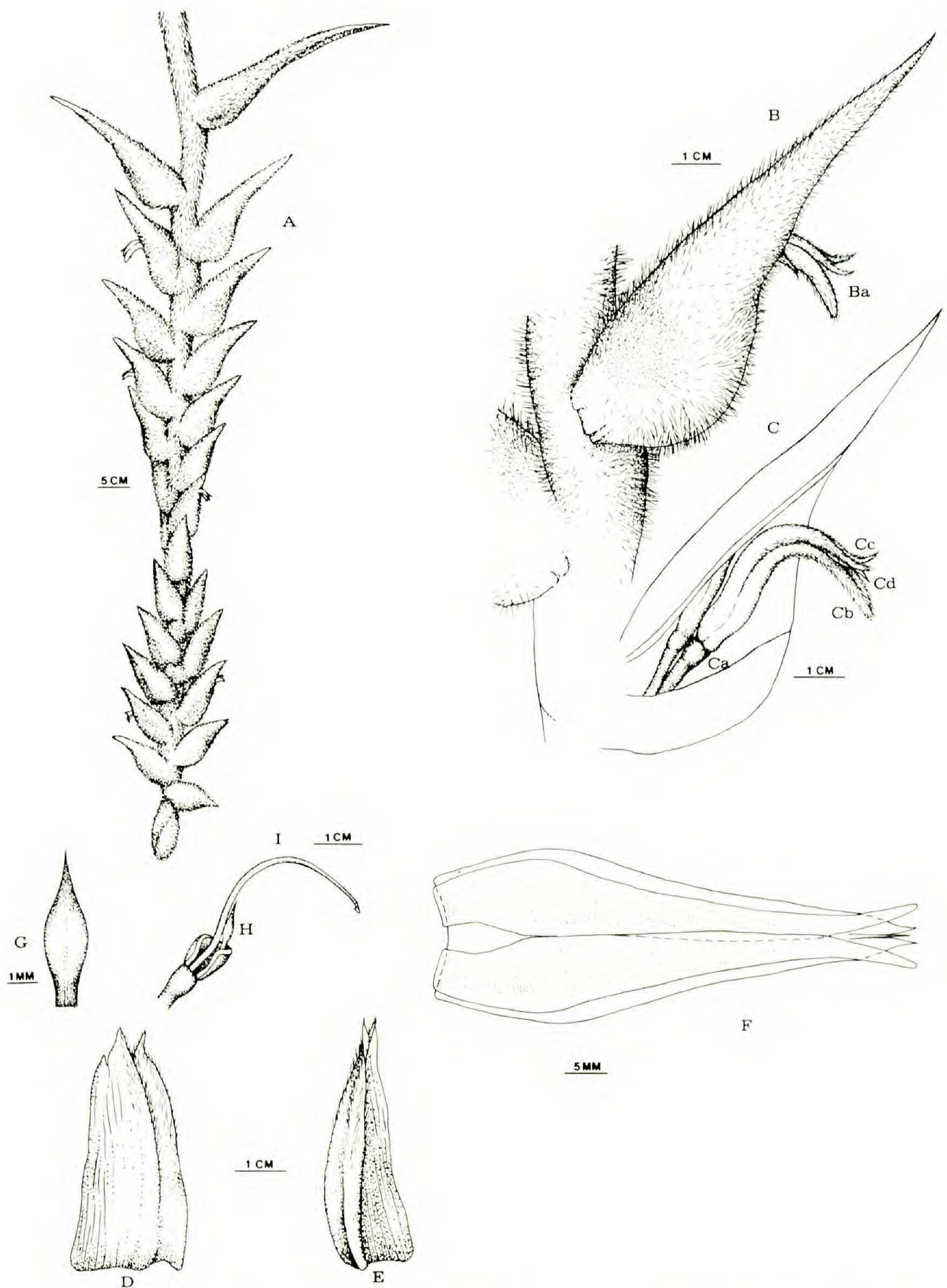


FIGURE 5. *Heliconia xanthovillosa*. A, inflorescence. B, C, cincinnal bracts: B, entire (Ba, flower protruding at anthesis); C, cut-away, floral bracts removed showing flower at anthesis (Ca, ovary; Cb, free sepal; Cc, fused sepals, slightly reflexed; Cd, anthers, included in apex of corolla tube). D, E, floral bracts: D, abaxial view; E, lateral view. F, perianth, outer surface showing two sepals fused to partially spread-open corolla tube. G, H, staminodes: G, abaxial view; H, position relative to style, lateral view. I, style and stigma.

& *Maas 5214* (MO), without further location, *Antonio 1266* (MO), *Folsom 3507* (MO).

PHENOLOGY. Flowering during the rainy season in Panama from late May to October; most likely producing fruit well into November.

HABITAT AND DISTRIBUTION. This species is found at middle elevations (ca. 500 m.) in open areas in the forest, and now especially in areas disturbed by man. It has been collected only along the continental divide separating the drier Pacific slopes from the wetter Atlantic slopes of Eastern Panama above the Río Carti.

RELATIONSHIPS. *Heliconia xanthovillosa* is closely related to species of the pogonantha group, including *H. vellerigera* Poeppig, *H. ramonensis* Daniels & Stiles, and *H. magnifica* Kress, which differ from each other essentially in bract and indumentum color and in bract orientation. *Heliconia xanthovillosa* has bright greenish yellow inflorescences with long, yellow hairs covering the peduncle, rachis, and distichous cincinnal bracts.

NAME. This species is named for the beautiful yellow hairs that are conspicuous on the entire inflorescence in both living and dried material.

***Heliconia collinsiana* Griggs var. *velutina* Kress, var. nov.**

A var. *collinsiana* in planta 6 m. alta, folio pagina inferiore glabra, pedunculo et rhachidi villosa, et perianthio aurantiaco, differt.

TYPE: Guatemala, Quezaltenango, lower slopes of Volcán Santa María de Jesús, along highway to Quezaltenango near Santa María de Jesús, elev. 1450 meters, 30 June 1977, *Kress, Clarkson, & McDade 77-756* (DUKE, holotype; F, K, isotypes).

Herb with *Musa*-like habit, to 6 meters tall. Leafy shoots in groups of 3 to 8; pseudostem glabrous to tomentose, 2.5–3 meters tall, 7 cm. in diameter; leaves 3 or 4 per shoot; petiole green, glaucous, 1–1.2 meters long, 2.5–3 cm. in diameter; blade with base unequal and obtuse, apex acute, the upper surface dark green, glabrous, with midrib light green and glabrous, the lower surface green, glabrous, with midrib light green with central maroon stripe and glaucous, the longest blade 2.2–2.5 meters long, 65–70 cm. wide. Inflorescence pendent, to 70 cm. long (excluding peduncle); peduncle rusty red, villous to velutinous with rusty hairs, 16–30 cm. long, 1.5–1.9 cm. in diameter; rachis flexuose, red, tomentose to velutinous, 1.1–1.3 cm. in diameter at base; cincinnal bracts spirally arranged, 15 to 18 per inflorescence, oriented 80–90° to axis of inflorescence, the basal bract usually fertile, the middle bract with apex acuminate, margins revolute, inner surface red and glabrous, outer surface deep red and glabrous, 14–17 cm. long, 6–7.5 cm. wide at base. Floral bracts opaque and quickly decomposing after anthesis, white, glabrous to puberulous abaxially, glabrous adaxially, 5–6 cm. long, 1.5–2.5 cm. wide at base. Flowers 15 to 20 per cincinnus; pedicel pale orange, puberulous, 1–1.7 cm. long; perianth pale orange becoming reddish along

sepal margins, glabrous to puberulous, 5.5–5.7 cm. long, 8–9 mm. wide at base, at anthesis curved 15–20°; free sepal lowermost, reflexed, fused sepals with apices not reflexed; staminode white, apex tridentate with central tooth longer than lateral ones, 9–12 mm. long, 4–5 mm. wide; stamens with anthers flared outside perianth apex; ovary pale green, glabrous, 7–8 mm. long, 7–9 mm. wide. Drupes metallic blue, glabrous, 1.2–1.5 cm. long, 1.6–1.8 cm. wide.

**SPECIMENS EXAMINED.** **Guatemala.** ESCUINTLA: Finca Monterrey, S. slope of Volcán de Fuego, elev. 1140–1260 m., *Standley 64533* (F). QUEZALTENANGO: road to Finca Pireneos near Santa María de Jesús, elev. 4000 ft., *Kress et al. 76-663* (DUKE); Volcán Santa María, elev. 4500 ft., *Kellerman 6073* (F); Volcán Santa María de Jesús, elev. 4500 ft., *Kellerman 6076* (US); Finca Pireneos below Santa María de Jesús, elev. 1350–1380 m., *Standley 68427* (F); between Finca Pireneos and Finca Soledad, lower south-facing slopes of Volcán Santa María between Santa María de Jesús and Calahuache, elev. 1300–1400 m., *Steyermark 33575* (F). SANTA ROSA: Cenaguilla, elev. 4000 ft., *Heyde & Lux 4635* (GH, US). SUCHITEPEQUEZ: Finca Mocá, in bushy growth at edge of barranca, elev. 5000 ft., *Skutch 2101* (GH). **El Salvador.** AHUACHAPÁN: Sierra de Apaneca in region of Finca Colima, *Standley 20081* (US). SANTA ANA: moist canyon slope, W. side of Cerro del Aguila, elev. 1650 m., *Tucker 1291* (F, UC, US). SONSONATE: Cerro los Naranjos, *ITICSS 1207* (MO).

**PHENOLOGY.** Flowering and fruiting mainly during the dry season (January to April) and the early part of the rainy period (May to July), but with some inflorescences usually produced at any time of the year.

**HABITAT AND DISTRIBUTION.** *Heliconia collinsiana* var. *velutina* is found on steep, forested slopes at middle to higher elevations (above 1300 m.) in the Guatemalan and Salvadorian highlands. It is one of the few species of *Heliconia* found at such high elevations.

**RELATIONSHIPS.** This variety is distinguished from var. *collinsiana* by its overall greater stature, lack of glaucous lower leaf surfaces, hairy peduncle and rachis, orange flowers, and distribution at higher elevations.

**NAME.** “Velutina” was used as a varietal epithet by both I. Lane and R. R. Smith but was never validly published by either. Here it is used since it is descriptive of the velutinous nature of the peduncle and rachis.

***Heliconia pogonantha* Cufod. var. *veraguasensis* Kress, var. nov.**

A var. *pogonantha* in planta 4–4.5 m. alta, folia pagina inferiore purpurascenti et inflorescentia glabra vel villosa, differt.

**TYPE:** Panama, Veraguas, 2 miles above Santa Fé beyond the Agricultural School, elev. 850 meters, 9 August 1977, *Kress, Clarkson, & McDade 77-825* (DUKE, holotype; K, MO, isotypes).

Herb with *Musa*-like habit, 4–4.5 meters tall. Leafy shoots in groups of 3 to 15; pseudostem scurfy, 1.3–1.7 meters tall, 5 cm. in diameter; leaves 3 or 4 per shoot; petiole yellow-green, glabrous, 1–1.2 meters long, 1.5–1.8

cm. in diameter; blade with base unequal and truncate to cordate, apex acute, the upper surface dark green, glabrous, with midrib yellow-green and glabrous, the lower surface green, tinged with maroon especially along margins, glabrous, with midrib yellow-green and glabrous to scurfy, the longest blade 1.2–1.5 meters long, 40–45 cm. wide. Inflorescence pendent, to 75 cm. long (excluding peduncle); peduncle yellow, scurfy to villous, 10–30 cm. long, 1.8–2 cm. in diameter; rachis flexuose, yellow, puberulous to villous, 1.8–1.9 cm. in diameter at base; cincinnal bracts spirally arranged, 20 to 25 per inflorescence, oriented 45–65° to axis of inflorescence, the basal bract usually sterile, the middle bract with apex acuminate, margins straight, inner surface reddish yellow and tomentose, outer surface red becoming yellow near rachis and glabrous to puberulous, 9–10.5 cm. long, 8–9 cm. wide at base. Floral bracts opaque, persistent, pale yellow, tomentose to velutinous with golden hairs abaxially, glabrous adaxially, 4–4.8 cm. long, 1.5–2.5 cm. wide at base. Flowers 10 to 15 per cincinnus; pedicel white to yellow, puberulous, 7–12 mm. long; perianth yellow, glabrous basally becoming densely velutinous with golden hairs distally especially along sepal margins, 5.4–5.7 cm. long, 1–1.1 cm. wide at base, at anthesis curved 80–90°; free sepal lowermost, fused sepals with apices reflexed; staminode white, apex acuminate, 6–7 mm. long, 3 mm. wide; stamens with anthers connivent inside apex of corolla tube, ovary white to pale yellow, glabrous, 8–9 mm. long, 5–6 mm. wide. Mature fruits not seen.

**SPECIMENS EXAMINED.** **Panama.** VERAGUAS: vic. of Santa Fé, forested slopes of Cerro Tute, elev. 3000 ft., *Allen 4333* (MO); road between Santa Fé and Río Calovebora, 1.8 mi. beyond Escuela Agricola Alto Piedra, elev. 735 m., *Croat & Folsom 34255* (MO); shoulder of Cerro Tute, *Folsom & Edwards 3355* (MO); beyond Escuela Agricola above Santa Fé, elev. 2600 ft., *Kress & Cooper-Smith 76-655* (DUKE), *Kress & Cooper-Smith 76-656* (DUKE), elev. 2800–4600 ft., *Kress et al. 80-1189* (DUKE); beyond Santa Fé along road to Calovebora, Pacific slopes, elev. 2200 ft., *Kress et al. 80-1200* (DUKE); lower montane wet forest 7 km. W. of Santa Fé, elev. 2900 ft., *Nee 11207* (US).

**PHENOLOGY.** Flowering from March to September, but at least a few individuals are flowering and fruiting at most times of the year.

**HABITAT AND DISTRIBUTION.** *Heliconia pogonantha* var. *veraguasensis* is restricted to middle elevation (735–1000 m.) wet forests and secondary growth in the vicinity of Cerro Tute on the Pacific slopes in Veraguas, Panama.

**RELATIONSHIPS.** *Heliconia pogonantha* is widespread in Central and South America, with many geographic varieties throughout its range. Var. *veraguasensis* is distinctive in its inflorescence with variable vestiture, its lower leaf surfaces tinged with maroon, and its overall stature smaller than that of the other varieties.

**NAME.** This taxon was given specific status by both I. Lane and R. R. Smith under the name of *Heliconia paulii*, but that combination was never validly published. Here it is designated as a variety and given the name “*veraguasensis*” after the province in Panama where it occurs.

***Heliconia ramonensis* Daniels & Stiles var. *xanthotricha* Kress, var. nov.**

A var. *ramonensi* in pubescentia lutea, pedunculo rubro-aurantiaco, et cincinnorum bracteis roseis, differt.

TYPE: Panama, Coclé, 6 miles beyond El Valle de Antón behind Cerro Gaital, elev. 900 meters, 13 August 1977, *Kress, Clarkson, & McDade 77-840* (DUKE, holotype; K, MO, isotypes).

Herb with *Musa*-like habit, 4–5 meters tall. Leafy shoots in groups of 3 to 10; pseudostem orange to brown, glabrous to villous, 1.3–2 meters tall, 5–8 cm. in diameter; leaves 3 to 5 per shoot; petiole green, glabrous, 1–1.2 meters long, 1.5–2 cm. in diameter; blade with base unequal and truncate to cordate, apex acute, the upper surface dark green, glabrous, with midrib yellow-green and glabrous, the lower surface green, tinged with maroon especially along margins, glabrous, with midrib yellow-green and glabrous, the longest blade 1.3–1.8 meters long, 40–60 cm. wide. Inflorescence pendent, to 90 cm. long (excluding peduncle); peduncle red, woolly with golden-yellow hairs, 30–50 cm. long, 1.6–2 cm. in diameter; rachis semiflexuose, red-orange, villous to velutinous with yellow hairs, 1.5–2.2 cm. in diameter at base; cincinnal bracts distichous or spirally arranged, 20 to 40 per inflorescence, oriented 40–45° to axis of inflorescence, the basal bract sometimes sterile, the middle bract with apex acute, margins straight becoming involute at base, inner surface pink and velutinous to villous, outer surface rose-red and glabrous to villous, 9–12 cm. long, 7–10 cm. wide at base. Floral bracts opaque, persistent, white to pink, villous to velutinous with bright yellow hairs abaxially, glabrous adaxially, 4–5 cm. long, 1.5–3 cm. wide at base. Flowers 10 to 15 per cincinnus; pedicel white to pink, glabrous, 7–13 mm. long; perianth white basally becoming yellow distally, glabrous basally becoming tomentose to velutinous with bright yellow hairs distally, especially along sepal margins, 5–6 cm. long, 1–1.2 cm. wide at base, at anthesis curved 90°; free sepal lowermost, fused sepals with apices reflexed; staminode white, apex caudate to acuminate, 7–8 mm. long, 2–3 mm. wide; stamens with anthers connivent inside apex of corolla tube; ovary bluish white, glabrous, 8–10 mm. long, 5–6 mm. wide. Drupes dark blue, glabrous, 1.3–1.5 cm. long, 9–10 mm. wide.

SPECIMENS EXAMINED. **Panama.** COCLÉ: base of three peaks beyond El Valle de Antón, elev. 800 m., *Kress & Cooper-Smith 76-651* (DUKE); hills near El Valle de Antón, elev. 800 m., *Maas et al. 1725* (MO, US); vic. of El Valle, elev. 800–1000 m., *Allen 1818* (MO); mountains N. of El Valle de Antón, elev. 2500–3000 ft., *Lewis et al. 1750* (MO); 8 mi. N. of El Valle de Antón, *Luteyn & Kennedy 1718* (DUKE, MO); region of El Valle de Antón on trail to Las Minas, elev. 1000 m., *Allen 2867* (US); Las Minas, *Allen 2707* (MO); El Valle de Antón, vic. Finca Tomas Arias, elev. 600 m., *Allen 3629* (US); foot of Cerro Pilón, above El Valle de Antón, elev. 2000 ft., *Porter et al. 4423* (scz, UC); below Cerro Pilón, *Croat 13471* (MO); La Mesa, 2.8–3.4 mi. NW. of El Valle de Antón, elev. 850–900 m., *Luteyn 4064* (DUKE); La Mesa, elev. 810 m., *Croat 25311* (MO), elev. 900 m., *Croat 22952* (MO), without further location, *Croat 14374* (MO, scz); La Mesa, near El Valle, *Antonio*



1292 (MO); La Mesa, 2 km. W. of Cerro Pílon, elev. 900 m., *Sullivan 541* (MO); ca. 9 km. from El Valle market beyond Sr. Furlong's Finca, *Kennedy et al. 3223* (DUKE, MO); Cerro Gaital, N. of El Valle, elev. 760 m., *Reveal & Balogh 4971* (MO); El Valle de Antón, behind Cerro Gaital, elev. 2200 ft., *Kress et al. 80-1161* (DUKE); N. rim of El Valle de Antón, near Cerro Turega, elev. 650–700 m., *Woodson & Schery 205* (MO); area surrounding Rivera sawmill, 7 km. N. of El Cope, continental divide, elev. 750–850 m., *Folsom & Collins 6430* (MO); forests along Río Boqueron above Peluca Hydrographic Station, elev. ca. 90 m., *Hunter & Allen 659* (MO).

PHENOLOGY. Flowering mainly during the rainy season from May to September, but some inflorescences are produced throughout the year.

HABITAT AND DISTRIBUTION. *Heliconia ramonensis* var. *xanthotricha* is found at middle elevations (650–1000 meters) on moist, forested slopes and often invades more disturbed open areas. Its distribution is localized in Coclé, Panama, in the region around El Valle de Antón.

RELATIONSHIPS. *Heliconia ramonensis* var. *xanthotricha* differs from var. *ramonensis* of Costa Rica in its distinctively yellower vestiture, especially on the peduncle, rachis, and floral bracts, and in the contrasting colors of the orange-red rachis and the rose-red cincinnal bracts.

NAME. Both I. Lane and R. R. Smith recognized this taxon as specifically distinct from other heliconias and referred to it as *Heliconia xanthotricha* because of the bright yellow hairs on various parts of the inflorescence. However, neither investigator published the name. Daniels and Stiles named a very similar taxon from Costa Rica as *H. ramonensis*. Therefore, I have used the descriptive epithet employed invalidly by both Lane and Smith and have published it as *H. ramonensis* var. *xanthotricha*.

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